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Southwestern MEDICINE

OFFICIAL JOURNAL OF THE SOUTHWESTERN MEDICAL ASSOCIATION AND EL PASO COUNTY MEDICAL SOCIETY

CONTENTS

New Mexico Medical Society to hear British Physician....Page 107
"Cradle to The Grave".....Page 108
By Robert B. Homan, Jr., M.D., El Paso
El Paso Center for The Treatment of Cerebral Palsy.....Page 109
The Surgical Approach to The Hypertension Problem (An Editorial).....Page 110
The Surgical Treatment of Hypertension.....Page 111
By James L. Poppen, M.D., Boston
The Status of Sympathectomy in The Treatment of Hypertension.....Page 114
By Leopoldo Villareal, M.D., El Paso
The Fundus in Hypertension and Arteriosclerosis.....Page 117
By Charles B. Elsberg, M.D., El Paso
Management of Acute Head Injuries.....Page 119
A Bulletin Prepared by The Harvey Cushing Neurological Society

April, 1950

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BRITISH PHYSICIAN, LEADING SCIENTISTS AT NEW MEXICO MEDICAL SOCIETY MEETING

Las Cruces will be host to the medical profession of the Southwest for the annual meeting of the New Mexico Medical Society, May 4 — 6. The physicians of Las Cruces are sparing no effort to make this get-together enjoyable and profitable. It must be realized that there is a perfectly tremendous amount of hard and tedious labor involved in such a project. The number of physicians to do this work in Las Cruces is not large, and it is only through their ability to work together as a unit that they have been able to accomplish so much.

In the very near future Las Cruces will officially open its new hospital. It is fitting that the annual meeting be held in a city which has the progressive spirit to bring about the erection of the fine, modern institution which is a credit, not only to the medical profession of Las Cruces, but to every citizen of the city itself. To the physicians attending the convention an opportunity will be afforded them to inspect and to obtain first-hand knowledge of what a modern community hospital is like. From this first-hand information, it is hoped that throughout the Southwest many similar institutions will make their appearance in the near future.

SOUTHWEST GROWING

The Southwest is a growing section, and hospital facilities must, and will, accompany this growth. Las Cruces has made the start; the rest of us should attempt to emulate. The physicians responsible for the meeting have been very painstaking in their selection of speakers for the ensuing meeting, and have chosen physicians, who will present the subject matter in such a way that it will be of value to the physicians in the Southwest, whether they be in the general practice of medicine, or whether they are limited to a special field. The following program will be presented:

THE PROGRAM

Speakers and subjects scheduled for the meeting May 4 - 6 in Milton Hall of New Mexico Agricultural and Mechanical College in Las Cruces will be:

Dr. J. S. Speed, orthopedist, member of the Campbell Clinic, Memphis, Tenn.; (1) Treatment of Ruptured Intervertebral Discs; and (2) Surgical Treatment of Difficult Nonunions of Long Bones by Means of Bone Grafts.

Dr. Allen J. Enelow, member of the faculty of the Menninger School of Psychiatry and member of the psychiatric staff of Winter Veterans Administration Hospital, Topeka, Kansas; (1) Alcoholism: Problems of Treatment and Research; and (2) A Psychiatric Viewpoint in The Practice of Medicine.

Dr. Henry M. Winans, professor of medicine, Southwestern Medical Foundation, Dallas, Texas; (1) The Significance of Pain; and (2) Who Has Heart Disease?

Dr. Willard R. Cooke, professor of obstetrics and gynecology, University of Texas Medical School, Galveston, Texas; (1) Moot Issues in Gynecology; and (2) Dystocia.

Dr. Russell J. Blattner, pediatrician of Baylor University College of Medicine, Houston, Texas; (1) Diagnosis and Therapy of Virus Rickettsial Infections; and (2) Meningitis.

Dr. Nathan A. Womack, professor of surgery, University Hospitals, Iowa University, Iowa City, Iowa; (1) Benign Lesions of The Breast; and (2) Surgical Treatment of Peptic Ulceration.

In the same vigorous spirit, the local committee has obtained as a guest speaker, Dr. Ralph J. Gampell of San Francisco, Calif., a British physician, who served in India with the British Medical Corps in World War II. Dr. Gampell on his return to his private practice following the war became dismayed with the prospect of practicing medicine under literally government supervision. This young man had a wife and a small baby to support, solely by the practice of medicine, in a small town, 150 miles north of London. When he began to realize that, not only had the nationalization of British medicine forced him into a position where he could no longer do justice to his patients, but also that because of official red tape he had essentially no income for eight months, but had to pay his income tax just the same, he took a very firm and decided view of the whole matter.

LEAVES ENGLAND

He left his native land and came to the United States and filed immediately for his citizenship papers. Dr. Gampell has an extremely excellent sense of humor, and a very adequate command of the English language, and is a convincing speaker on the subject of socialized medicine. He is now interning at the St. Joseph's Hospital in San Francisco, and is interested in becoming a general practitioner in the rural areas. The Editor of SOUTHWESTERN MEDICINE has been given to understand that he is seriously considering entering the practice of medicine in a small city in Southern New Mexico. The medical profession of the Southwest will welcome this physician because he exemplifies the views of the vast majority of Southwestern physicians.

SOUTHWESTERN MEDICINE urges that every one of its readers make an earnest effort to attend the annual meeting of the New Mexico Medical Society at Las Cruces. The local physicians of Las Cruces are working vigorously, and their only recompense will be a large and enthusiastic attendance. This much is due them, and it is the duty of each and every practitioner of medicine in this area to co-operate with them and attend the meeting which will unify the medical profession as a whole in the Southwest. Such unification is the essence of success in the battle against socialism, not only of medicine, but the nation as a whole.

ANTISTINE APPROVED

The Council on Pharmacy and Chemistry of the American Medical Association has recently announced the acceptance of three forms of antistine. This antihistaminic has been found to be effective in the relief of allergic symptoms with relatively low side effects.

It is a valuable adjunct in allergic therapy since Friedlaender and Friedlaender reported that 90.2 per cent of their patients with vasomotor rhinitis received symptomatic relief when treated with antistine or pyribenzamine.

The forms of antistine accepted by the Council are tablets of 100 milligrams, ophthalmic solution 0.5 per cent and nasal solution 0.5 per cent.

De Rebus Medicis Et Politicis

BY ROBERT B. HOMAN, JR., M. D., EL PASO, TEXAS
MEMBER OF THE HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION

"CRADLE TO THE GRAVE"

Frank G. Dickinson, Ph. D., the distinguished economist, now with the Bureau of Medical Economic Research of the A. M. A., has written and spoken some very astute words which should be of interest to the medical profession and layman alike. Dr. Dickinson believes "that health progress is at once the measure and the core of social progress".

During the first half of the twentieth century America has enjoyed man's greatest half century but, said Dr. Dickinson, "We have also endured a social revolution more important than the fall of the Roman Empire, the Rennaissance, the French Revolution, or the Industrial Revolution. This latest social revolution lies in the fact that the distance from the cradle to the grave is much longer for the average man".

"In 1900 there was no sentiment for "cradle to grave" schemes. Most of us living in 1900 were close to the cradle. Most of the people living today are far from their cradle days. This social revolution is the basis for the sentiment for "cradle to grave" schemes. We are faced primarily with medical and health progress in half a century which has come so fast that we have difficulty digesting it into our social institutions and into our way of life."

PLACES BLAME

Dr. Dickinson thus puts the blame for the demand for social security, socialized medicine, and other social reforms on the great increase in the population in the older age groups. Some statistics to bear out this increase of older population are distinct evidence of our health progress since 1900. Here are four examples:

1. In 1900 about one-third of the people dying had lived 50 years. In 1949 about three-fourths of the deaths were among people 50 years old or older.

2. The older half of the people dying in 1900 had lived 30 years or more. The older half of the people dying in 1949 had lived 66 years or more. The median age at death has advanced about 36 years!

3. One thousand babies born in 1900 were destined to live 49,000 years. In 1949, the same number of new-born were destined to live 68,000 years.

4. Since 1900 the entire population of the U. S. has doubled (75 to 150 milion). In the same period the population age 65 and over has quadrupled (3 to 12 million).

It would appear that these statistics pose a problem to be answered by society and particularly by the medical profession — how to keep this group of elderly people not only alive but productive? Should a man automatically be retired at 65 years of age? If so, Heaven help us! Geriatrics seems to be becoming an attractive field!

Let's let Dr. Dickinson continue—"I think "cradle to grave" is a scheme whereby those close to the grave would fasten themselves on the pay-checks of those closer to the cradle, and ride piggy-back to the grave — — — I think we face a grave problem of social morality — — — What kind of a standard of social morality do you want in this country? That is the basic question — — — Many years ago when we became old enough to vote, we faced a world in which we knew that there was ahead of us a life-time of working, earning, and saving — — — For our children we have, I think, largely thoughtlessly — created a world in which about all they can look forward to is a life-time of working, earning, and **paying taxes.** That, I submit, is not a fair proposition. It is not reasonable — — — Do we want to press down upon our youth this crown of security thorns?"

The next few years are going to test the social morality of the American people. Shall we accept government paternalism with higher taxation, or shall we stay with free enterprise and individual freedom.

Herpes Zoster: Treatment With Chloramphenicol

"Four patients in the acute stage of herpes zoster were given chloramphenicol orally in doses of 250 mg every four hours for 24 doses. In every instance there was definite improvement after 24 hours and after 48 hours disappearance of the pain and marked regression of the skin lesions. All progressed rapidly to complete recovery without remission or residual neuritic pain. There was no evidence of intolerance to the drug."

"Two patients with severe postneuritic pains were given chloramphenicol in the same dose. No improvement resulted. Actual scarring and nerve damage, continued dependence on drugs for relief of pain and psychic and nutritional factors are so often complications in these patients that improvement was not expected."—Dawson, L.M., and Simon, H.E., *South. M.J.* 42:696, 1949.

Aureomycin Therapy In Human Brucellosis Due To Brucella Abortus

"Aureomycin is now known to be effective in the treatment of human brucellosis due to Brucella abortus and Brucella melitensis." [Diagnosis proved by culture of the organisms.]

"A daily dose of 2 gm of aureomycin administered over a period of ten days to two weeks was adequate for most patients."

"Aureomycin produces almost immediate improvement in the subjective well-being of the patient and a rapid fall in temperature. Its oral administration is easy and free from dangerous side effects. Hospitalization is not necessary. Treatment with streptomycin and sulfadiazine has not been consistently attended by rapid improvement in symptoms or fever, and the well known side actions may be serious."—Braude, A. I., Hall, W. H., and Spink, W. W., *JAMA* 141:831, 1949.

EL PASO CENTER FOR THE TREATMENT OF CEREBRAL PALSY

El Paso now has a center for the treatment of cerebral palsy or spastic paralysis. This center has been vitally needed for sometime, because during the war there was no treatment center available for this condition.

By the organization of the Texas Society for Crippled Children and the cooperation of the public on buying Easter seals this center has been made possible. The Society provides a trained technician. The sale of the seals has provided the necessary funds, and thus the local citizens provide for the support. The National Organization of course, provides for the actual training program and has furnished the services of a well-trained technician.

Miss Carme Philips, right, technician at El Paso Cerebral Palsy Center, gives one child conditioned reflex exercises, while a young mother, left, aids her daughter to learn to walk with the assistance of skis.

There are many worthwhile spastic or cerebral palsy cases, who with proper training can be made to become self-sufficient. These patients not only require medical care but they require extensive technical training in order to learn to use their involved muscles.

The center provides for the training not only of the patients but also of the parents, so that the problem is understood better and the patient has a better chance of overcoming the handicap.

At the present time this center is located at the El Paso General Hospital on the second floor of the main building.

The patients can secure admission to this clinic independently of the hospital. They merely should report to the center, and arrangements will be made not only for treatment but also first for thorough diagnostic studies by a capable group of doctors, who volunteer their services.

This is a great aid in this area to patients so involved, and it is absolutely essential for the management of the cerebral spastic. The cerebral spastic case, for the benefit of the lay reader of this article, is one who cannot control the muscles properly. Most of these patients have a so-called scissors gait, that is they cannot uncross their legs. Their spastic muscles cause the legs to be overcrossed.

Operative care can eliminate the crossed over legs. It also can aid such other conditions as flexion contractures of the knees or bent knees. Many cases have feet which cannot be straightened up so as to allow the patient to walk on the floor and surgery or careful splinting under Orthopaedic care can take care of this. There are various other situations which can be corrected surgically.

By far, however, the most important thing in the management of these cases is careful daily training over a period of many years in order to aid the patient in gaining proper control over the muscles, so that useful acts may be performed with the extremities. This is all important and it is the purpose of the spastic training center to provide this careful training and supervise home care. In this way many of these patients can learn to walk and to use the arms in such a fashion that they will become useful and happy citizens rather than neglected dependents.

Miss Philips gives a young polio victim resistive exercises to help strengthen her leg muscles.

THE SURGICAL APPROACH TO THE HYPERTENSIVE PROBLEM

Physicians for many years have been confronted with the problem of hypertension. Tedious hours of research and study have not as yet afforded us the answer to this complex and intriguing phenomenon. Each year brings new hope to the unfortunate individuals who are afflicted with severe degrees of hypertension, only unfortunately to have these hopes blasted by study and clinical observation. Substances ranging from watermelon seeds to garlic have had their advocates, and have fallen by the wayside. As the physician delves further into the intricate problem, he becomes surer that scientific medicine has practically only scratched the surface.

Over a period of years various surgical approaches have by necessity entered into the therapy of this syndrome. Of these sympathectomy has stood the test of time better than any other type of surgical procedure. Unfortunately there exists in the minds, of clinicians, much confusion as to the results of sympathectomy. One may hear one clinician tell of good results and another clinician speak of rank failures.

This is due in most cases to the fact that over a period of years the extent of denerviation has been increased; and the extensive operation employed by the majority of surgeons interested in this field today by necessity is giving very much better results than the incomplete denerviations of previous years.

SELECTED CASES

Physicians interested in this approach to the problem of hypertension fully realize that this is not the answer to the treatment of this disease, but do feel that in carefully selected cases it has a definite indication and adequate results. The medical profession in general should take care not to condemn this procedure without acquainting themselves fully as to the modus operandi. Very recently a patient with rather severe hypertension was advised that perhaps sympathectomy might be indicated. Elsewhere he was told that sympathectomy had no place in the treatment of hypertension, and that it was a distinctly mutilating operation.

Such statements reflect only the gross ignorance of the physician, and take from the patient in certain selected cases their only hope of any relief from their hypertension state. Sympathectomy is not the answer to the question of hypertension; and it may be safely said that no matter how extensive it may be it will still not be the ultimate in the treatment of this condition. On the other hand, in well selected cases, it does relieve symptoms, and there are indications that it well may prolong life. For this reason serious consideration must be given this procedure by every practitioner of medicine who in his daily practice is dealing with this condition which we know so little about, and which we so inadequately treat.

SOUTHWESTERN MEDICINE is taking this opportunity of presenting to its readers two papers written by men from entirely different geographical locations. The patients concerned would be different, especially as regards the psychosomatic make-up, and their problems and daily routines would vary considerably. These patients have one common factor, hypertension. The results of both surgeons, working independently, curiously enough to a great degree are parallel. This alone must arouse great interest in the minds of students of medicine.

Relief From Pruritus Following Upon Administration of Adenylic Acid

"In all, 36 patients were treated with the sodium salt of adenosine-5-monophosphate, injected intramuscularly in a solution of 20 mg in 1 cc of water. Dosage of 20 mg hourly for 5 consecutive hours over a period of 3 days yielded fairly uniform results. . . . Approximately half of the patients responded to the therapy within 24 hours, the others in from 2 to 7 days."

"In 5 instances the pruritus was associated with diabetes, . . . 9 with Hodgkin's disease, one with carcinoma of the ovary, one with dermatitis due to hair-dye sensitivity, 18 were idiopathic, and 2 occurred post partum. In almost every instance the pruritus was severe (inducing in some of the sufferers talk of suicide) and had previously been subjected to numerous therapies: salves, injections, x-ray, ultra violet rays, etc. Distribution was general in 20 instances, limited to anus or genitalia in 12 instances, to the legs, feet and hands in 4 instances. Skin of many of the patients was excoriated, in some instances severely so."

"Results were negative for 6 patients and positive for 30. There were 9 cases of complete subsidence, 14 of marked improvement, 5 of moderate improvement, and 2 of mild improvement. Not enough time has yet elapsed to make possible the assembling of statistics as to how enduring these results may be. Five patients have remained free of recurrence or maintained the state of improvement from discontinuance of therapy to date, this period varying from one to four months; others suffered recurrence within 24 hours to one month."—Rottino, A., *Proc.Soc.Exper.Biol. &Med.* 71:379, 1949.

AIR FORCE MEDICAL SERVICE

The U. S. Air Force Medical Service will commission 300 civilian physicians now serving as internes, as first lieutenants on active duty with the Air Force Medical Reserve Corps, Major Malcolm C. Grow, Surgeon General of the Air Force announced recently. Eligible to receive commissions are medical school graduates now serving interneships at approved hospitals, who have at least six monts of interneship training remaining. Physicians who are so commissioned will serve two months of active duty for each month of interneship as commissioned officers of the Medical Reserve Corps. Upon finishing active duty tours, officers who apply and are selected, as members of the regular Air Force Medical Corps, will be eligible for participation in the Air Force Residency program to be conducted at civilian and military hospitals. Complete information concerning the interne program may be obtained on written request to the Officer's Procurement Branch, Office of the Surgeon-General, Headquarters, U. S. Air Force, Washington 25, D. C.

TRUE AESCULAPIAN STAFF

Since there seems to be no basis for the belief that the ancients attributed healing powers to Hermes or Mercury, it is probably that the confusion in using the caduceus as a medical emblem arose from its similarity with that Aesculapius is always depicted holding at his side, a knotty staff with a single serpent coiled around it. Because the snake renewed itself periodically by sloughing off its old skin, the Greeks considered it a natural symbol of healing.

THE SURGICAL TREATMENT OF HYPERTENSION

By James L. Poppen, M. D.,
Department of Neurosurgery, The Lahey Clinic,
Boston, Massachusetts

The treatment of essential hypertension has not been solved. Definite progress toward this end has been made, however, in the last decade. This is noteworthy since the etiology of this condition remains obscure. Credit should be given to the surgeon for stimulating the investigative work which is being done to solve the problem of hypertension. It is needless to say that never before has there been as careful an analysis of patients suffering from hypertension. Unfortunately, in the past the report of results has been based upon impressions rather than facts. It is the tendency of all of us to remember the patient who did well and forget the less fortunate results, regardless of the type of therapy. I am certain that surgeons are not under the impression that sympathectomy is the only answer in the treatment of hypertension. It is true that a few reports have seemed overenthusiastic whereas a few have been unenthusiastic about results following sympathectomy. The problem, as I see it at the present time, is not the relative merits of surgery versus medicine. There are, of course, considerable differences of opinion regarding the treatment of hypertension in a given patient, and this will always be true. There are internists who believe that no patient should ever be subjected to surgery in an attempt to treat hypertension and it is quite probable that some drug will be developed in the future that will cure certain types of hypertension. In the meantime, however, I do feel from experience with a large group of surgically treated hypertensive patients that surgery is worth while in treating certain phases of the disease.

FEW GROUPS STUDIED

Very few large groups of medically treated patients have been systematically studied for a long period of years. The Keith-Wagener study is a notable exception. Recently Burgess has analyzed the results of 100 medically treated patients, with interesting results that had previously been suspected, although not substantiated by factual evidence. Palmer et al studied 646 cases, which is a noteworthy series, followed for eight years from the medical standpoint, indicating that a follow-up of fifteen to twenty years is necessary to be certain one form of treatment is superior to another as indicated by longevity.

The rise or fall of sympathectomy in the treatment of hypertension will be determined chiefly by the answers to the questions, "does it make the patient live longer," and "is the morbidity less in the patients who do live longer?"

In many instances decided lowering of the blood pressure occurs following dorsolumba sympathectomy. Considerable credit should be given to Adson and Craig, of the Mayo Clinic, and Peet, of Ann Arbor, who initiated the surgical treatment of hypertension in the United States. Smithwick combined the supradiaphragmatic approach of Peet with the subdiaphragmatic approach of Adson and demonstrated that extensive removal of the sympathetic nervous system was necessary to obtain prolonged lowering of blood pressure. Grimson, in 1941, described the technic for total thoracic and partial to total lumbar sympathectomy.

PEET TECHNIC

In my experience since 1934 with the surgical treatment of hypertension, the technic suggested by Peet was first employed. Later the subdiaphragmatic approach was used as advised by Craig and Adson. In 1938 the latter technic was combined with a unilateral nephro-omentopexy. Since 1940 by gradual evolvement, the operation has become more and more extensive.

It has been shown by many investigators that regeneration of the sympathetic nervous system is most difficult to retard. That this is true has been demonstrated to my satisfaction in several instances in which gaps made in the splanchnic trunk of several centimeters were completely filled in by regenerated tissue. The silver clips which had been placed on the proximal and distal ends of the splanchnic nerve were completely grown over by a neuroma formation of sympathetic tissue, the intervening regenerated trunk being perfectly capable of transmitting reasonably normal sympathetic impulses. The preoperative blood pressure levels and severe headaches had returned in patients after two years had elapsed and these patients were subjected to further removal of the sympathetic nervous system, with alleviation of subjective and objective symptoms. It has been my experience that if a drop in blood pressure does not occur within a reasonable length of time following operation, more extensive removal of the sympathetic nervous system will not be beneficial. Therefore, subjecting hypertensive patients to further sympathetic denervation is justified only in patients who have obtained relief of symptoms for six months or more and whose previous complaints then returned as the blood pressure became elevated. Neither the mortality nor the morbidity is increased by the technic that is employed at the present time and the added assurance that a more complete denervation has been accomplished makes this procedure a justifiable one.

ROUTINE REMOVAL

The technic employed at the present time has been described elsewhere. The fourth thoracic to the second lumbar inclusive are routinely removed. The results of the extensive dorsolumbar sympathectomy have led us to change our criteria for the selection of patients. Sympathectomy is of little or no value to those who have suffered severe cardiovascular or renal damage.

In the selection of patients there are two courses to follow : (1) to operate on all patients with hypertension except the moribund or (2) to curtail the indications for operation. We have used the Wagener-Keith classification of hypertension. In Group I the blood pressure drops to normal on rest, and the fundi are Grade I which is demonstrated by an increased light reflex of the retinal vessels. In Group II the blood pressure drops to normal or near normal on rest or sedation with sodium amytal, with fundi Grade II, demonstrating compression at the arteriovenous crossings and often demonstrating segmental, migrating constriction of the artery. In Group III the blood pressure drops but little on rest or sedation and hemorrhage or exudate is demonstrated in the fundi, in association with marked migrating or persistent segmental constriction of the arteries. In Group IV the blood pressure is high and does not drop on bed rest or sedation with sodium amytal. In the latter test, the diastolic pressure stays well above 100. The fundi demonstrate papilledema with hemorrhage, exudate and fragmentation of arteries. Patients with

Grade III or IV fundi hay have labile blood pressure, that is the diastolic pressure may drop below 100 mm. of mercury on sedation with sodium amytal or will drop after administration of vasodilators with the patient in the supine position.

TREATMENT DESCRIBED

We rarely operate immediately on patients with Grade I fundi and on patients if any whose blood pressure falls to normal on rest. We prefer to follow their course for a period of time and attempt medical treatment. Many patients with benign hypertension will tolerate their labile blood pressure well for a normal life span. If, under observation, their basal resting diastolic pressure is consistently found to be above 100 mm. of mercury or signs of vascular or cardiorenal damage develop, operation is advised. Patients over 50 years of age are rarely accepted. However, we have operated on a few patients between 50 and 57 years of age if they still have a labile blood pressure and do not show evidence of arteriosclerosis. We reject patients with long-standing hypertension who have reached the age of 50 and who seem to be tolerating their hypertension well. Minor cerebrovascular accidents from which the patient has largely recovered do not by themselves contraindicate operation. No patient is accepted who has severe right-sided congestive heart failure, but those who have experienced episodes of nocturnal dyspnea are not considered to have a contraindication if the renal function is good and the blood pressure labile. We reject patients who have any severe degree of coronary insufficiency or who have had coronary infarction. The existence of mild angina pectoris with normal exercise tolerance tests, a normally sized heart, and without much dyspnea on exertion, or angina pectoris with a large neurogenic factor does not contraindicate operation. We do not accept patitnts with poor renal function, especially if the nonprotein nitrogen remains over 40 mg. per 100cc. or if the intravenous pyelogram shows inadequate concentration of dye. Poor concentration on the Fishberg test, poor phenolsulfonphthalein excretion, albumin in the urine, poor urea clearance, and a few casts or red blood cells in the urine should not individually rule out a candidate. A combination of such poor results, however, points to such renal damage that it may be considered irreversible and the patient rejected for operation.

SCREENING OUT

We carefully screen out the following: glomerulonephritis, coarctation of the aorta, polycystic kidneys, pheochromocytoma, brain tumors, endocrine disease such as Cushing's syndrome, the systolic hypertension of arteriosclerosis and unilateral Goldblatt's kidney. In the case of Goldblatt's kidney it has been our policy to do a splanchnicectomy on the same side as the nephrectomy is performed. We then wait to see whether there is a secondary rise of blood pressure after this first stage splanchnicectomy. If there is, splanchnicectomy on the other side is carried out. If no elevation of blood pressure takes place after the first stage splanchnicectomy, the hypertension is not completed.

We reject the patient with Grade IV fundi if he has a fixed blood pressure with or without the usual widespread cerebrocardiorenal disease.

The positive indications for operation are as follows.

Operation is urged on patients with Group II fundi and labile blood pressure because good results are obtained in 73 per cent. We especially recommend operation if there are signs of degenerative cardiovascular disease in which we believe the changes are still reversible. This may include individuals with enlarged hearts but without a history of congestive failure. If there is evidence only of early renal sclerosis with albumin in the urine, with some limitation of concentration and nocturia, they are accepted for operation. Albumin and nocturia will often disappear after splanchnicectomy. We operate on many patients with Group III or IV fundi if there is a fair degree of lability of blood pressure and none of the cardiovascular renal contraindications, stated previously, are present. We include patients for operation who have chronic pyelonephritis with hypertension whose nonprotein nitrogen is not elevated and whose intravenous pyelograms still show fair power of concentration. An added requirement for the treatment of chronic pyelonephritis is sterilization of the patient's urine before operation.

PATIENTS REVIEWED

In May 1947 Lemmon and I thoroughly reviewed 100 patients on whom I had performed extensive sympathectomies. Early in the series the operation extended from the ninth thoracic through the second lumbar ganglion and later from the fifth thoracic through the second lumbar ganglion. Evans and C. C. Bartels reviewed 275 patients in whom I had removed the fourth thoracic ganglion through the second lumbar ganglion, and the results were interesting from a comparative standpoint. The study of the results of high dorsolumbar sympathectomy from the fourth thoracic to the second or third lumbar ganglion was undertaken in an attempt to ascertain whether a larger number of patients with all types of hypertension was being treated by this method than by lower sympathetic resection in the former series. Special interest was taken to determine whether more patients with Group III fundi could be salvaged. All of the operations have been performed by one operator. Although this series was followed a shorter time and doubtless with the lapse of the time the figures will not be as marked, the superiority of the results in patients with Grade III fundi, that is hemorrhage with exudate, has been striking, rising tenfold, from 4 to 44 per cent. The poor results have dropped one-half, from 37 to 15 per cent. Good results in patients with Group I and Group II fundi have almost doubled, from 39 to 74 per cent; poor results are less than half, having dropped from 23 to 9 per cent. High dorsolumbar sympathectomy did not protect 8 of 273 patients in this series from subsequent cerebrovascular accidents, 2 of them fatal. Angina was wholly or partially relieved in 60 per cent of 15 patients, none of whom had serious coronary disease.

Ninety per cent of patients with abnormally wide transverse diameters of the heart showed reduction of heart size, 64 per cent to normal. There was improvement in 42 per cent of 50 patients who had abnormal electrocardiograms. Seventy-five per cent of 45 patients with nocturia reported complete or partial relief. Renal function tests were improved in 58 per cent of 55 patients who had one or more impaired tests before operation. Retinal vascular changes improved in 66 per cent of 170 patients.

OPERATIVE MORTALITY

The operative mortality was still 0.5 per cent. The mortality rate for the entire series within the follow-up period of six to thirty-three months was 7 per cent. I do think that we should be loathe to consider this type of operation with its prolonged, uncomfortable convalescence as a prophylactic operation for benign hypertension, but I do urge it on patients under 50 years of age with spastic, exudative and hemorrhage retinal arterial changes, moderate cardiac damage and signs of early nephrosclerosis.

The important point so far as I can determine is that the more extensive operation evidently does not increase the mortality, it still being 0.5 per cent in patients on whom the more extensive sympathecto-

mies were performed. Therefore, if sympathectomy is going to answer the question of hypertension, in a well selected group which it obviously does for the time being at least, then one should not tailor the operation as has been suggested by others. The reason for this is that the sympathetic nervous system regenerates very rapidly, indeed. We know that sympathetic ganglion cells may be present in the rami communicantes; we also know that the splanchnic trunk is made up of branches from the thoracic ganglions and that it may originate as high as the fourth thoracic ganglion, and in one instance in the eighth thoracic, even though in most instances the topmost branches come off the fifth or sixth thoracic ganglion. Since it is so difficult to reoperate on these patients after a sympathectomy has once been performed, I believe that if sympathectomy is indicated at all, one should remove the entire splanchnic system, in that manner at least retarding regeneration for a greater length of time, and perhaps permanently interfere with the efficiency of the system.

EJACULATORY POWER

That the lumbar sympathetic nervous system has a definite influence on the ejaculatory power in the male is well known. It seems reasonable to assume that in a system so variable as to the structure of the ganglions and the number of rami, the ejaculatory power may at times be distributed equally in the lumbar ganglions even though most frequently one must assume that the first or second lumbar ganglion is predominantly in control. Our results do not prove which of these is the more dominant, but there is evidence that resection of both of them frequently interferes with the ejaculatory power. One of the patients who was impotent and childless had been married for ten years before operation. He had never used any contraceptive devices. Resection included the first and second lumbar ganglions on both sides. Twenty-eight months after the surgical procedure he stated that power of erection, libido and potency were excellent and ejaculation normal. This patient became the father of a baby boy. Forty-one per cent of the male patients had normal ejaculation after the operative procedure; 21 per cent had no ejaculation. In 18 per cent the power of ejaculation was diminished. Libido and potency were the same as before operative intervention in 65 per cent, diminished in 23 per cent and improved in 12 per cent.

Abnormal sexual changes were not noted in the females.

COMMENT

The final opinion as to the merits of thoracolumbar sympathectomy as a means of treatment of essential hypertension must necessarily remain open until the surgical and medical survival curves are compared for a period of many years. Since the operative mortality is 0.5 per cent and since several previous reports, as well as those of our series, indicate that a substantial number of patients obtain a good result, as evidenced by an arrest of the disease which allows a considerably more comfortable existence, we can arrive at no other opinion than that the procedure is well worth while in a selected group of patients.

It must be realized that hypertension is the leading cause of death and is four times as deadly as cancer. In many cases it causes as much discomfort to the patient as does cancer, in which one does not hesitate to make use of surgical means in an attempt to cure the disease or to lessen suffering. It is true that sympathectomy in the treatment of hypertension may well be replaced by directed intracranial operation on the blood-pressure centers or by the discovery of certain chemical or hormonal substances that will cure the disease. On the other hand, this may not occur in the present generation. Therefore, a surgical procedure that gives reasonable assurance of correcting or lessening the effects of the disease should be instituted until a more efficacious treatment has become available.

The objection to this operation lies in the fact that the patient is hospitalized for a period of about four weeks. Four days are spent in study. Many patients have considerable postoperative neuralgia, which lasts for several days or several weeks after their return home. Because of the alterations in blood pressure produced by changes in position, the legs and abdomen may need firm pressure bandages or support to avoid syncope or palpitation for several weeks or months after the operative procedure until the blood pressure has become thoroughly stabilized.

SUMMARY

A summary of the results, combining the Groups I to IV, demonstrated that excellent to good results were obtained in 63 per cent, fair in 24 per cent and poor in 11 per cent. As to subjective relief, 78 per cent of the patients in Groups I and II were relieved and 63 per cent in Group III obtained decided relief, but in Group IV two-thirds of the patients failed to obtain relief or died.

Operative Vs. Nonoperative Procedures For Uterine Fibroids

"Fibromyomas of the uterus, the most frequent tumors of the female genital tract, are functional growths dependent to a large degree on estrogenic stimulation."

"When the general practitioner discovers uterine fibroids, he should be cautious and reserved in announcing the presence of a 'tumor' to the patient, in order to avoid alarming and producing a severe and permanent psychic trauma. He may safely tell the patient that:

(a) Fibroids rarely require emergency treatment.
(b) They do not lead to cancer formation.
(c) More than 50 per cent may be watched and may never require operations.
(d) Small fibroids situated on the fundus rarely interfere with pregnancy and safe delivery.
(e) At the menopause small fibroids involute and disappear."

"Involution of fibroids near or at the menopause is delayed by premature administration of estrogens."

"Fibroids up to the size of a 3 month fetus may be expected to shrink to clinically unimportant residua with the menopausal involution."

"The present tendency in the treatment of fibroids still is too radical. Operation is performed too often."
—Frank, R.T., J.A.M.A. 140:1001, 1949.

Excessive Hypertension of Long Duration

"Hypertension, even of an excessive degree, that has been present eight years or more and is not associated with well established cardiac or renal disease usually does not indicate a poor prognosis. In fact the patient usually lives to within three or four years of his normal life expectancy."

"It is suggested that when the physician is confronted with a patient who is not over fifty years old and in whom he finds excessive hypertension, frequent examinations should be made for evidence of progression, especially for the signs of retinal, renal or cardiac damage. In the absence of such evidence it is believed that resort to surgery may well be delayed."—Burgess, A.M., *New Eng. J. Med.* 239:75, 1948.

THE STATUS OF SYMPATHECTOMY IN THE TREATMENT OF HYPERTENSION

By Leopoldo Villareal, M. D.,
El Paso, Texas

Approximately one year ago Dr. Villareal presented a paper relative to the surgical management of hypertension before the El Paso County Medical Society which was carried in SOUTHWESTERN MEDICINE. Many of the readers of SOUTHWESTERN MEDICINE expressed interest in the follow-up of the cases reported. Dr. Villareal with his usual courage of his convictions has reviewed his previous cases in a talk before the Staff of the William Beaumont General Hospital, and has graciously allowed the editors of SOUTHWESTERN MEDICINE to carry this article in the present issue. It is peculiarly fitting that this article should be carried with a similar article by Dr. Poppen, as it affords the readers an over-all view of this particular phase of the treatment of hypertension.

Although sympathectomy has been used in the surgical treatment of hypertension since 1933, and a great deal of study, analysis of operated cases and research has been done, there still exists a great deal of confusion in the minds of surgeons interested in this problem, both as to the selection of patients, technique of operation and end results. If this situation exists in the minds of the men doing the work, there is no reason to be surprised why it should not be more so to the internist, who must be impressed by certain facts: that the operation has not been placed on a rational basis; that although symptoms are spectacularly relieved, the durability of the improvement remains open to question; that a review of the literature will show contradictory statements about every single phase of the problem. All of this confusion is understandable when one realizes the complete haze which exists about hypertension itself; its etiology, classification and treatment.

We have been interested in the problem of hypertension for about 11 years. During this time we have gradually increased the range of desympathectomizing a patient from the Peet procedure to the thoracolumbar resection of Smithwick, to the present radical resection of removing from third dorsal through third lumbar. What, in our minds, has been justification for the doing of these procedures? We have tried to answer whether this operation would accomplish two purposes, that is (1) relief of symptoms and (2) prolongation of life.

COMPARISON MADE

Regarding the first point one has only to compare a surgical group of cases with a group treated by non-surgical measures to realize that the operation brings about relief of symptoms in 80 to 85% of the cases. The progression of the hypertensive state is retarded; the recurrence of complications has diminished and the elimination of hypertensive retinopathy has occurred in most patients. As to the second point, the answer is less clear. This is due to the variations in technique as well as extent of resection. Each surgeon usually gradually extends the level of resection, plus the fact that extensive resections have been carried out over too short a period to be of true value. We have been doing our present extensive procedure for 4 years. Last year we presented before the Medical Society a review of 26 cases and have since then done 11 more. We will, from time to time, give a follow-up review on all of these cases, for only after following these cases, treated with a standardized treatment and followed for a number of years, will we have an answer to some of the problems listed in the preceding paragraphs. Up to this time, we believe, however, that life is prolonged. **Why do we believe this?** Because of results obtained as in the following two cases:

Note No. 1: Mrs. A. I., 52 years of age, had a blood pressure of 290/160, severe encephalopathy, EKG signs of marked left ventricle strain. Had a bilateral thoraco-lumbar sympathectomy 4½ years ago. Since then, under a full active life, has never had a pressure recorded higher than 170/90. The headaches are gone, the shortness of breath is gone.

Note No. 2: Mrs. M. G. B., 42 years with severe insomnia, nervousness, palpitations, tachycardia, headaches, blood pressure 250/130. Sympathectomy 4 years ago. Last recorded B. P. in Dec. 1949, 152/84. No symptoms. Normal active life as a housewife.

LIFE PROLONGED

Certainly, I cannot help but feel that life in individuals like these, who have had such a heavy burden lightened, is prolonged. How long will these results last, I do not know. These two cases have been over 4 years and there is no evidence of beginning retrogression to their former state.

As long as we are able to answer these 2 points in the affirmative with our own cases, we will continue to slowly tread through the complex problems of sympathectomy in hypertension.

Hypertension is a common symptom of some 50 or more fundamentally different disorders. Page has classified these under 5 different headings:

(1) Renal (2) Cerebral (3) Cardio-vascular (4) Endocrine (5) Unknown. The first four groups contain many generally recognized disease entities, such as chronic nephritis, chronic pyelonephritis, intracranial tumors, coarctation of the aorta and tumors of the pituitary or adrenal glands. All of these conditions must be excluded before a diagnosis of essential or malignant hypertension can be made.

In a disease such as hypertension, it is important that everybody know what type of cases are being discussed, and the results presented are for what types of cases. Until this is standardized, it will be impossible to judge impartially the results present. For this we need a thorough understanding of what classification the author is using. The basis of all classifications is the concept of Keith Wagener and Barker, that hypertension per se, causes increasing damage to cerebral, retinal, cardiac and renal structures and the stage of the disease can be defined by the advancing damage in these organs. We use the de Takats classification which consists of three groups instead of the four in the basic classification. Group I

is a combination of the old No. 1 and No. 2 Wagener-Keith and Group III is a combination of late grade 3 and 4. This is used because of the conviction that the malignant and premalignant phases of hypertension are not a surgical problem and secondly, because the grade I and early grade 2 of Keith give excellent operative results.

GROUPS CLASSIFIED

Classifications of groups:

Group I. Age below 40, minimal or no detectable organic damage, normal blood pressure on complete rest or barbiturates. Casual diastolic blood pressures about 100 Man. Hg.

Group II. Age up to 55 yrs., mod. vascular sclerosis in all organs, well demonstrable angiospasm, diastolic pressures cannot be lowered below 110 mm. Hg. by any method, rising diastolic pressure during the last 6 months.

Group III. Large recurrent retinal hemorrhages and exudates or papillo-edema. High fixed diastolic pressure which cannot be lowered below 120 Mm. Hg.; congestive or anginal heart failure; poor renal function; numerous cerebro-vascular accidents; an actual malignant or pre-malignant state of hypertension with continous maximal angio-spasm not influenced by depressor stimuli.

All of these classifications are simply the expressions of the degree of organic vascular damage. Whether the hypertension is renal or non-renal does not find expression in these classifications. Since it is the so-called neurogenic hypertension which is considered the ideal case for sympathectomy by most of the men doing this work, it is felt that what is urgently needed is a separation of the renal from the non-renal factor. It is becoming obvious that both may operate in the same patient, in varying sequence and varying proportions. It is clear to most surgeons in this field that in attempting to correct hypertension, he can, at best, hope to influence some of the factors. Sympathectomy, as practised today, if extensive enough, can diminish sympathetic adrenal activity, inhibit renal spasm and, above all, diminish anteriolar tone. Certainly, it does not affect the psyche, the parenchymal lesion of the kidney and probably not the adrenal cortex. Therefore, in selecting cases, it is important to exclude those wherein the latter factors are predominant.

CONTRA-INDICATIONS

We consider the following as absolute contra-indications to operation:

(1) Extensive organic damage to brain retina, heart, or kidney. Persistent papillo-edema and nitrogenous retention are absolute contraindications. A previous stroke or coronary occlusion is not necessarily considered as a contraindication.

(2) Mechanical obstruction to circulation. In this group is included coarctation of the aorta or regurgitation; likewise, the rigid sclerotic aorta, with the high pulse pressure.

(3) Marked psychic involvement.

Selection of Patients:

No single test or combination of tests has proved accurate to a high degree in spite of considerable study of this phase of the problem.

Hinton and Lord, in a recent review, attempting to arrive at some conclusion on this problem, studied 66 patients who had done specially well. They were studied from the following standpoints: Age, sex, known duration of hypertension, average pluses on their scale, average blood pressure, renal status. We are quoting theirs, and for the sake of interest, giving our corresponding figure.

Theirs		Ours
	AGE	
42 yrs.	Average	45.2
58 yrs.	Old	59
19 yrs.	Young	39
	SEX	
45 yrs.	Females	23
21 yrs.	Males	8
	DURATION OF HYPERTENSION	
7 yrs.		6 yrs.
	AVERAGE TOTAL PLUSES	
6		5

Table I
Definitions

IN GENERAL IN ANY SYSTEM—

0 Normal.
1 plus Slight or mild changes.
2 plus Moderate changes.
3 plus Moderate changes.
4 plus Advanced or marked changes.

CEREBRAL—

0 No symptoms or signs.
1 plus Headaches and/or dizziness and nervousness.
2 plus Above, plus nosebleeds and/or occipital headaches.
3 plus Above, plus paresthesias.
4 plus Stroke or encepthalopathy or confusion.

EYES—

0 Normal.
1 plus Arteriolar narrowing.
2 plus Above, and arteriovenous nicking.
3 plus Above, plus hemorrhages and exudates.
4 plus Above, plus papilloedema.

CARDIAC—

0 No symptoms or signs.
1 plus Slight symptoms and/or slight cardiac enlargement and slight electrocardiographic changes.
2 plus Moderate symptoms and/or moderate x-ray enlargement, and moderate electrocardiographic changes.
3 plus Marked symptoms and/or marked cardiac enlargement and marked electrocardiographic changes.
4 plus Coronary occlusion or congestive heart failure.

RENAL—

0 Normal.
1 plus Nocturia but concentration of 1.024 or more and urea clearance of 75% or more.
2 plus Urea clearance of 40-75%, concentration of 1.015-1.023.
3 plus Urea clearance of less than 40%, concentration less than 1.015, normal chemistry.
4 plus Persistent elevation of N.P.N. to 45 mgms. or more, and B.U.N. to 25 mgms. or more.

RULES

Contraindications to thorocolumbar sympathectomy:

1. 4 plus Renal.
2. 4 plus Cardiac in which congestive failure is unremitting, or if coronary occlusion has occurred within three months.
3. 4 plus Cerebral if confusion exists or if a stroke has occurred within three months.
4. If there are two 4 plus other than eyes.
5. If total count equals eleven or more pluses.

The renal stutus was good in 64 of 66 of their patients, in all 31 of ours. This, then, is a pre-requisite since it is a known fact that thorace-lumbar sympathectomy improves renal function very little.

AVERAGE BLOOD PRESSURE

195/125 215/125

In order to properly evaluate the cerebral, cardiac, renal and muscular status of each patient, the following studies, in addition to a careful history and physical must be done.

(1) Fundus exam. (2) EKG (3) Six foot heart plate. (4) Urine conc. test. (5) Urea clearance test. (6) N.P.N. and Creatinine. (7) Urinalysis. (8) Intravenous pyelogram. (9) B.M.R. (10) Psychiatric evaluation.

All patients are tested with Sodium Amytal test. We agree, however, with almost everybody else that all pressor and depressor tests are entirely unreliable in the selection of patients.

TYPE OF OPERATION

We are today using a modification of the Smithwick procedure, removing from the third dorsal through the third lumbar, bilaterally in two stages, one week apart. This extensive sympathectomy is made possible by utilizing a long hockey stick, para vertebral incision which goes trans-diaphragmatically. Following the suggestion of Poppen a paravertebral section of the 11th and 8th ribs is done, and then the pleural fold is reflected forward, exposing the chain and resecting as much as is deemed necessary for the patient.

RESULTS AND POST OPERATIVE COMPLICATIONS

Thirty-seven cases of hypertension are being reported on, who have undergone 73 sympathectomies, all with the same extensive technique. All have been done within the last 4½ years. There has been one death in the series, this was due to a coronary thrombosis which occurred immediately after the first stage. We have had no post-operative uremias. There were two pleural effusions, one of them complicated by a local wound infection on one side. The pleura has been torn in spite of painful dissection in about 25% of the cases. As reported before, intercostal neuralgias and back aches are a real problem. Postural hypotension is present if adequate denervation is carried out, but this is not disturbing after 6 to 8 weeks.

In conclusion one can state that there can be little question that sympathectomy has a place in the ill-defined program of treatment of hypertension, but in view of its tentative rationale and the wide difference of opinion as to its value, it must be regarded as an experiment as yet unfinished.

*Address delivered at Wm. Beaumont General Hospital, February 24, 1950.

SYNDROME OF SALT DEPLETION

"Seven cases are briefly reported that demonstrate some of the untoward effects, including 4 fatalities, which may occur in cardiac patients subjected to a regimen of sodium restriction and sodium diuresis. The blood urea nitrogen was determined in 7 patients, the blood chlorides in 6 patients and the blood sodium in 1 patient while the phenomena of congestive heart failure were present and while this regimen was still being used."

"The blood chloride and the blood sodium were reduced and the blood urea nitrogen was elevated in each instance. . . . The great advance in the therapy of heart disease by the introduction of a regimen of sodium restriction and sodium diuresis is emphasized, but the importance of individualizing this therapy and of being alert to the possibility of the patient's having passed from the therapeutic to the toxic stage of this therapy is particularly stressed."

"Note.—No salt substitute was used by any of these patients, so that neither lithium nor potassium intoxication had to be considered as possible aggravating factors." — Soloff, L.A., and Zatuchni, J., J.A.M.A. 139:1136, 1949.

Army Exhibit At Neurological Congress

"Founders of Neurology in the past century" is the theme of an exhibit by the Army Medical Department displayed at the Fourth International Congress of Neurology, held recently in Paris. The exhibit featured the photographs and copies of the outstanding work of 122 of the world's greatest neurologists, representing 16 countries. The selection was made by a committee of 25 leading American Neurologists. Many of the books and photographs are from the collection of the Army Medical Library and are quite rare. Dr. Webb Haymaker, chief of the neuropathology section of the Armed Forces Institute of Pathology, expressed the hope that "as the leaders in the field of neurology meet to exchange ideas on present-day problems, the exhibit will enable the rich heritage left by such masters as Claude Bernard, Cajal, Charcot, Helmholtz, Hughlings Jackson and Pavlov, remind us that the history of a subject cannot be divorced from its pursuit and that scientific achievement knows no international boundary."

Auromycin

"A preliminary study of 25 patients with lymphogranuloma venereum treated with aureomycin, a new antibiotic [with apparent virucidal properties] is reported. Eight patients with buboes were treated and showed a decided reduction in size of the node at the end of four days' treatment.

"Three patients with proctitis were treated and showed decided improvement, in 2 instances after four days and in the third case after eight days. . . . Fourteen patients with benign rectal stricture due to lymphogranuloma venereum were studied and showed no gross pathologic change in the fibrous rectal stricture although there was decided decrease in rectal pain, discharge and bleeding. There was an increase in the diameter of the stool.

"The clinical results in the three types of lymphogranuloma venereum discussed . . . showed such results as to warrant further extensive research and clinical trial of the antibiotic."—Wright, L. T., et al., J. A. M. A., 138:408, 1949.

THE FUNDUS IN HYPERTENSION AND ARTERIOSCLEROSIS

Charles P. Elsberg, M. D., El Paso, Texas

Diseases of the vascular system of the eye are of the greatest importance, not only because of their effect on the nutrition of the membranes, but also for their consequences on vision and its relation to systemic diseases.

The fundus of the eye is the only place in the body in which arteries and veins can be seen directly and clearly without surgical interference and with high magnifications. The retinal vessels are easily and clearly observed with the ophthalmoscope and changes in their walls, even of a minute character, are readily detected with the high magnification of the direct method.

Retinal vessels frequently show the same changes that affect the vessels in any other part of the body, so that general arteriosclerosis, hypertension and nephritis have ocular symptoms. Retinal vessels are an off-shoot of the cerebral vessels and therefore, important diagnostic conclusions can be made of the condition of the concealed cerebral vessels from the study of the retinal system. The name of cerebroscopy was given by Bouchut many years ago to the examination of the retina and its circulation. "Cerebroscopy" is an exaggeration, but still has the merit of emphasizing the importance of the pathology of the retinal vessels.

ARTERIES

The arteries branching from the main trunk in the papilla correspond by their size to the arterioles of any other part of the body. They end in capillaries which empty into the veins and do not communicate in any part of their course with the choroidal vessels. The retinal vessels thus form a terminal system; and, when morbid changes occur, which retard or impede the circulation of the blood, extremely grave consequences result for the nutrition of the retina.

In order to clarify how the structural features of the inner membranes of the eye can produce a given ophthalmoscopic picture it is necessary to correlate the one with the other, pointing out the anatomical facts which underlie certain appearances of the fundus. The minutest details of the normal fundus must be studied, not merely for their scientific value, but because a basic knowledge of these details is essential for the recognition and interpretation of pathological conditions.

In the large trunks the distinction between the arteries and veins is easy to make; the color is different; the arteries are of a bright yellowish red; the veins are strikingly darker, wine red or blue red. However, there is not so marked a difference in the smaller twigs, and it is frequently necessary to trace the vessels to their sources in order to make the distinction between the arteries and veins.

The retinal vessels never anastomose with each other. They frequently cross, and of the two vessels one is always an artery and the other a vein. The artery may be above the vein or vice versa.

REFLEX DESCRIBED

In the center of the arteries, which have a double contour, is a bright yellowish stripe called the reflex. It is about one fourth the breadth of the artery. There is also a reflex streak in the veins, narrower and less distinct than that of the arteries, its breadth being about one-twentieth of the diameter of the vessel.

What causes this light streak has been a subject of much discussion. Experiments and calculations made by Pierce, Wilmer and Friedenwald have shown that the light streak is due to the reflection of light on the convex surface of the vessels. They maintain that this surface is the external surface of the media or muscular layer of the arteries. In pathological conditions where there is an increase of the thickness of the media there is produced a widening of the light reflex.

The color of the fundus as seen with the ophthalmoscope depends upon the red background of the choroid from which the light is reflected through the filter of the retinal pigment. It will, of course, vary greatly with the amount of pigment present and this usually corresponds to a degree to the complexion of the patient. Thus, a decided blond will have a very light orange-red fundus while the fundus of a brunette is of a much darker red. In the Negro most of the light is reflected by the pigment epithelium itself and the fundus appears of a slate-gray color against which the vessels stand out sharply, the disc appearing pale by contrast. The retina anterior to the pigment epithelium is transparent in the normal eye and therefore is invisible in ordinary light. The vessels are visible and of these it is only the column of blood which is seen, the walls, when normal being transparent.

VEINS LARGER

We are taught that the veins are somewhat larger than the arterioles, usually in the proportion of five to four. It is acknowledged that the veins engorge after meals, and on excitement and therefore it is more important to note the size of the arterioles — not the so called five to four ratio. It is important too, to note that the width of the arterioles is greater in the inferior field and also in the temporal field. The normal size of the arterioles has been measured as follows

Temporal Field	Nasal Field
1. Superiorly: 110 Micra	1. Superiorly: 50 Micra
2. Inferiorly: 130 Micra	2. Inferiorly: 60 Micra

thus, saying that an arteriole in the nasal field is sclerotic merely because it is much smaller than those in the temporal field, is not correct. A further aid to show that it is a normal arteriole is the fact that these arteriolar light reflexes will show parallactic displacement.

Sclerosis of the retinal arterioles may be primary local, isolated disease but more often is associated with a systemic arteriolar sclerosis. The pathogenesis of both forms is still unsettled and confused and it would be impossible to discuss it here. Among the causes of general sclerosis have been mentioned alcoholism, senility, hypertension and nephritis, but it may be produced by infections (syphilis). Volhard and Mylius have recently advanced the theory that it is the result of spasm in the arterioles. The latter observed in the pre-eclamptic stage of the toxemia of pregnancy are transitory, spastic contractions of the retina arteries which are localized but change rapidly in degree and may appear at various points. If the

toxemia increases, the vascular spasm may assume a tetanic form and remain unchanged for hours or days.

PREVAILING VIEW

The prevailing view is that it starts with a fibrous thickening of the media due to abundant neoformation of the connective tissue and elastic elements followed by hyaline degeneration. The endothelium of the intima is finally involved and proliferates (endarteritis with thrombus and occlusion).

As stated before, the walls of the arteries in the normal retina are transparent. The first ophthalmoscopic sign of sclerosis is the veiling, decoloration and opacity of the walls of the arteries, which become visible as yellowish stripes on either side of the blood column. As the latter is also seen through the hazy wall, its color is changed to a pallid red. As the opacity progresses, the walls become entirely opaque and apear as white lines on either side of the blood column. The blood column is gradually narrowed by the restriction of the lumen, until the vessel is entirely obliterated and transformed into a white cord.

Another important ophthalmoscopic symptom is the broadening of the light streak in the arteries. The thickness of the media increases the width of the light reflex, relatively to the diameter of the lumen. At the same time an increase in the refractive index of the media will intensify its brightness. Sometimes this brilliant reflection, contrasting with the light yellow vessel wall on either side, makes the artery resemble copper wire (copper wire artery). At other times, when the wall becomes whiter, the artery looks like a silver wire (silver wire artery).

SIMPLE CLASSIFICATION

A simple classification of arteriolarsclerosis is:

Grade I —Loss of translucency and increase in light reflex.

Grade II —Light reflex is more marked and there is a slight a-v-nicking.

Grade III—Light reflex is extremely conspicious, calibre of vessel is diminished and there is marked a-v-nicking; There is a venous deflection.

Grade IV—Vessel is reduced to a mere thread.

Spasm may be very difficult at times to differentiate from sclerosis but the following may be of aid: namely, spasm reveals a decrease in light reflex associated with a loss of retinal lustre. The results of anoxemia-edema, exudates, and hemorrhages may be found in both spasm and sclerosis.

If the retina of pregnant women whose blood pressure is rising is examined frequently, the spasm of the arterioles can be recognized. The spasm may vary in degree or situation from day to day. It may be localized or diffuse. Later, if the constrictions persist, individual cotton-wool patches and hemorrhages appear in the retina. If the patient having arteriolar changes receives proper medical care, hemorrhages and cotton-wool patches will seldom occur, — and the full involvement of the retina should never be allowed to develop before delivery. It is important to emphasize that these patients have little, if any disturbance of vision.

When the spastic process is long and severe, the retinal changes may become organic and irreparable, in which case definite vascular changes persist after the delivery, together with arteriosclerotic kidney.

NEW RESEARCHES

The new researches on the role of arterial constriction and high blood pressure in the pathogenesis of arteriosclerosis and nephritis, have given new basic facts which point to a common origin for the three types of retinosis:

Albuminuric, arteriosclerotic and diabetic — essentially are the same — and findings are due to anoxemia: exudates and hemorrhages. It must be thoroughly understood that there is no pathognomonic fundus pattern of diabetes, for all of the changes can be duplicated in arteriosclerosis, and even lipaemia retinalis may result from high cholosterol. The classic description of "central punctate diabetic retinosis" is correct and complete—but only appears in the beginning of retinal involvement. The white spots are much smaller than those of nephritic retinosis and are located behind the retinal vessels. Hemorrhages (deep) may or may not be present. When considering the fundus changes resulting from nephritis, due consideration must be paid to both arteriosclerosis and hypertension, for often it is difficult to separate the signs of one from the other.

A simple, helpful classification of hypertension is as follows:

Grade I	Spasm
Grade II	Spasm + sclerosis
Grade III	Spasm + sclerosis + retinopathy
Grade IV	Spasm + sclerosis + retinopathy + papilledema

Above 115 Diastolic blood pressure — usually get retinopathy.

Below 115 diastolic blood pressure — usually don't get retinopathy. Spasm is a reversible process — just as are the signs of anoxemia, viz: edema, hemorrhages and exudates. Sclerosis is not a reversible process.

COURSE OF HYPERTENSION

The course of hypertension is one of interrupted or continuous progress. Many patients, especially women have been seen for more than twenty years before any hemorrhages appeared, and in many the systolic pressure was always 200 or higher.

More attention must be given to the signs of beginning decompensation. A single retinal hemorrhage may be the signal of approaching death, and, if disregarded, danger lies ahead. The extensive exudates and the papilledema are more often recognized because of their grossness.

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UNRESOLVED PNEUMONIA

An Exclusion Diagnosis

"Study and care of pneumonia patients should be continued until all pulmonary [x-ray] shadows have disappeared or age proved to be due to fibrosis. True unresolved pneumonia is rare while bronchiectasis, atelectasis and intrabronchial diseases are more common. Unresolved pneumonic exudate is situated in the alveoli and interstitial tissues where it may eventuate in fibrosis."

"Unresolved pneumonia is a diagnosis which can be established only after disease of the tracheobronchial tree has been excluded. The indiscriminate and inaccurate use of the term 'unresolved pneumonia' is disparaged."—Hinkel, C. L., *Am.J.Roentgenology* 61:335, 1949.

MANAGEMENT OF ACUTE HEAD INJURIES

A Bulletin Prepared for
THE COMMITTEE ON TRAUMA
of the
American College of Surgeons
By The Special Committee of
THE HARVEY CUSHING NEUROSURGICAL SOCIETY

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Head injuries may be classified as (A) open and (B) closed. Open injuries incur the risks of (1) hemorrhage and (2) wound infection. Closed injuries involve the risks associated with (1) immediate destruction of brain tissue (contusion, laceration, etc.) and (2) progressive damage secondary to (a) cerebral compression due to intracranial hemorrhage or edema, and (b) anoxia resulting from an inadequate airway.

For clarity, the treatment of open and closed wounds will be considered separately in this bulletin, but it is to be emphasized that both often are seen in the same patient and require consideration jointly.

TREATMENT OF OPEN WOUNDS

The proper treatment of **laceration of the scalp** consists of thorough cleansing, débridement and snug closure. As a first-aid measure, a compression bandage should be applied to control bleeding. Externally protruding foreign bodies should not be manipulated. When the patient's general condition permits and adequate equipment is available, the following procedure should be undertaken:

(1) Shave scalp widely about the wound.
(2) Cleanse wound with soap and water and irrigate thoroughly with copious amounts of solution (saline or water).
(3) Infiltrate margins of scalp wound with procaine.
(4) Remove dirt and excise devitalized portion of scalp.
(5) Explore skull for fracture.
(6) If no fracture, close wound snugly in one or two layers with interrupted sutures of nonabsorbable material.
(7) Give antitetanic serum or tetanus toxoid.

Simple lacerations may be closed in the Emergency Room by a single operator, but it is more satisfactory if the operator has an assistant to compress the margins of the wound to control bleeding.

Where the **laceration overlies a fracture,** surgical correction should be undertaken only in the Operating Room, for it may be necessary to remove dirt, hair, or débris from the fracture line or to remove bone fragments. One should be prepared to deal with bleeding from the dura and brain.

If the **brain is lacerated** or **foreign bodies are retained** within the brain substance, all macerated brain tissue should be removed, the foreign bodies removed if possible, particularly if they are nonmetallic, all bleeding controlled and the dura and scalp closed snugly. Surgical treatment of these wounds requires experience in brain surgery and special equipment (suction, lighting, electrocoagulation, etc.). With the use of chemotherapeutic and antibiotic agents, it is permissible to defer operative closure of wounds for many hours pending improvement in the patient's general condition and analysis of his neurologic status.

Leakage of cerebrospinal fluid from the nose or ear constitutes a special problem. Any cerebrospinal fluid fistula invites the risk of meningitis. Now, with an adequate screen of antibiotic and chemotherapeutic agents, one is justified in waiting ten to twelve days pending spontaneous closure. If the leak persists longer than this, surgical closure of the fistula should be considered. Some feel that lowering of the spinal fluid pressure to 99mm. of water by spinal drainage every twelve hours promotes spontaneous closure. Fortunately most fistulas do close spontaneously.

CLOSED WOUNDS

One of the most frequent causes of death after head injury is progressive cerebral damage due to anoxia. Many factors contribute to this:

(1) The capacity of the contused brain to utlilize oxygen is diminished.
(2) The cerebral blood flow is reduced, even though blood pressure may be elevated.
(3) The oxygen concentration of the blood is diminished as the result of a disturbed respiratory tract (tongue, mucus, pneumonitis).

The treatment in such cases is the maintenance of an adequate airway and the administration of oxygen. Patients frequently improve remarkably after clearing the airway and administering oxygen. The most satisfactory way of giving oxygen is by nasal catheter. Oxygen tents and masks interfere with attempts to keep the airway patent. Constant nursing attention, with a suction apparatus for the removal of mucus, is necessary. This may be supplemented by postural drainage (head down on face). Tracheotomy is indicated in certain cases.

The **differential diagnosis** between surgical and nonsurgical lesions is of primary importance in the management of acute head injuries and usually depends upon the patient's course. Hence, a carefully taken history, particularly as relates to the onset and duration of unconsciousness, and frequent and repeated neurological examinations are necessary.

Intracranial clot, such as extradural, subdural or intracerebral hematoma, usually is incompatible with life and requires surgical removal. Most patients with these lesions show progressive stupor, convulsions, focal paralyses and disturbance of the vital signs, such as alteration in pulse, respirations, etc. If the patient has been conscious and then loses consciousness, an expanding intracranial lesion is probably present. The

* Deceased.

lucid interval may be prolonged (days or weeks) with subdural hematoma. If the patient has remained continuously unconscious from the moment of impact, the coma may be due in part to contusion of the brain and in part to an expanding lesion. In such instances, it may be impossible to make a differential diagnosis clinically, and cranial exploration then is necessary if the patient's condition is growing worse.

The **surgical management** of these lesions is not within the scope of this paper.

SPECIAL EXAMINATIONS AND TREATMENTS

(1) **X-rays.** X-rays of the skull rarely influence the course of treatment, yet the procedure of taking films involves considerable manipulation and wastes time, both of which are detrimental to the ill patient. Hence, it is advisable that x-ray examination of the skull be deferred until such time as the patient is co-operative and his condition stabilized. Attention should always be given to the possibility of injury elsewhere, particularly to the cervical spine.

(2) **Position of Patient.** The position of election is with the head elevated, since this reduces venous congestion. The advantages of this position, however, are far outweighed by the disadvantages which might accrue from an obstructed airway, and if the patient's airway cannot be kept completely open with the head elevated, this position should be changed to one which best promotes an adequate airway.

(3) **Shock.** Surgical shock (peripheral vascular collapse) is rare in head injuries per se, but, when present, the usual measures (Trendelenburg position, intravenous fluids, heat, etc.) should be employed. Shock usually indicates associated injuries and demands primary consideration.

(4) **Fluid Balance.** In an effort to reduce or limit cerebral swelling after head trauma, certain writers have advocated rigid dehydration by withholding fluids, administration of hypertonic solutions intravenously, the use of magnesium sulphate enemas, etc. Rigid dehydration does harm rather than good to an ill patient, as the other vital body functions are interfered with. Fifteen hundred to 2000 cc. daily are necessary to keep the patient in fluid balance.

It is necessary in this connection to keep close watch upon the protein metabolism. Coma, stupor and prolonged confusion often result from protein depletion and can be prevented or corrected by the administration of protein hydrolysates, plasma or whole blood. If coma is prolonged, gastric feedings by nasal catheter are indicated, using a high protein diet.

(5) **Spinal Puncture.** Considerable controversy prevails concerning the indications for and the merit of spinal puncture in the diagnosis and treatment of head injuries. Some advocate daily spinal punctures as routine in the treatment of head injuries, but this is not generally accepted. The authors of this bulletin consider the indiscriminate use of spinal punctures dangerous. The following are considered proper indications for spinal puncture.

(A) Diagnostic—
  (a) To determine pressure where intracranial clot is suspected.
  (b) To determine the presence and/or degree of bleeding.

(B) Therapeutic—
  (a) To lessen intracranial pressure by withdrawing fluid as a temporary expedient pending measures that provide more lasting control of increased intracranial tension, such as surgical evacuation of clot.
  (b) Evacuation of bloody fluid when signs of meningisimus appear, usually four to eight days. Evacuation of fluid at this time usually relieves headache and speeds recovery.

Technique. When indicated, a spinal puncture should be done with the patient in the lateral recumbent position, using a standard spinal puncture needle.

The operator should make the following determinations: color of the fluid, initial pressure, final pressure and the amount withdrawn.

Jugular compression tests should not be carried out unless one suspects injury to the spinal column. These tests give no information of value with reference to the brain, and the sudden rise in spinal fluid pressure which follows jugular compression may be harmful after head injury.

Spinal puncture should not be attempted if the patient is unco-operative, for the information obtained is unreliable, and struggling against resistance may be harmful.

(6) **Control of Restlessness.** Patients who are restless and confused constitute a difficult nursing problem, and sedative medication may be necessary. Paraldehyde administered rectally or barbiturates — sodium amytal, sodium luminal — intramuscularly or intravenously are satisfactory. The latter are particularly indicated for the control of convulsions. Morphine and codeine are contraindicated because of depression of respirations, edema of the larynx, and alteration of pupils (diagnostic).

(7) **Convalescence.** Early ambulation is recommended after head injury. The patient should receive physical therapy in the form of active and passive exercises early and should be gotten out of bed into a chair as soon as he is able and willing to co-operate. Prolonged bedrest is conducive to traumatic neurosis.

Lacerations of the brain, such as are associated with depressed fractures and penetrating wounds, are frequently followed by a convulsive disorder. These patients should be given anticonvulsive medication for a period of several months after injury. The drug of choice is Dilantin Sodium gr. 1½ three times daily.

Many patients complain of residual headache, particularly in the posterior part of the head, and of dizziness. These symptoms generally are classified as posttraumatic neuroses. Recent observations indicate that they may result from trauma to the cervical roots and at times are relieved by cervical traction.

NOTE: The foregoing is one of several articles distributed by the Committee on Trauma, American College of Surgeons, through its Regional Committees.

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